

Integrating of E-learning to Improve Students Competence in Vocational School

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Abstract—This study discusses how integrating an e-learning to improved students competence in vocational school. This study was categorized as qualitative research that used case study approach. This research took place at one of Vocational High School and University in Special Region of Yogyakarta. The informants in this research were the expert technician of IT, lectures of IT/IS, teachers in SMK, and students in SMK. The data were collected through observation, in-depth interviews, and documentation. The technical analysis of the data referred to the analysis of Miles & Huberman interactive model, including data collection, data condensation, data display, and drawing and verifying conclusions. The result showed that: (1) teachers haven't been fully exploiting of e-learning to support adaptive learning in class, because they mostly haven't mastered of ICT and lack of supporting facilities; (2) e-learning used to upload course materials, some to create online quizzes, and discussions; (3) e-learning is used by young teacher or those who master of the ICT field and average in study program of ICT; and (4) governments and NGOs have provided an e-learning for schools, teachers, students, and other that they can use it for learning but few users use it.

Keywords—*e-learning; competencies; ICT; vocational school; digital classroom*

I. INTRODUCTION

Every year, growing users of the internet in Indonesia have been significantly increased. It is influenced by the increasing number of internet service providers and installation of BTS simultaneously in the regions. Badan Pusat Statistika (Central Statistics Agency / BPS) in collaboration with Asosiasi Penyelenggara Jasa Internet Indonesia (The Indonesian Internet Service Providers Association / APJII) noted that the growth rate of internet users in Indonesia in the end of 2013 had reached 71.19 million people [1]. The percentage of internet usage in Indonesia cannot be separated from the role of the Government through the Ministry of Communication and Information which has successfully strengthened internet infrastructure in the regions since 2013.

Internet users in Indonesia are dominated by young people. At least 30 million children and adolescents in Indonesia are internet users [2]. The young generation with social media became the biggest contributor to internet usage in Indonesia. In fact, Indonesia has become a large number of Twitter users in the world [3]. According to Tifatul Sembiring, the majority

of respondents have used online media for more than a year, and the average respondent claimed, they learn about the internet from friends in firstly [2]. Thus the ease of use of the internet has been felt by children and young people.

The digitization process is very influential in several fields, such as economic and social. In European countries, they are very concerned about the impact caused by digitization in all these fields. Digitalization and globalization can have an impact on increasing the number of unemployed people.

In the US, UK, and other advanced economies, there are digitalization concerns, combined with globalization and the offshoring of manufacturing, will lead to increasing unemployment and growing income inequality [4]. The application of technology in several fields must be encouraged to increase productivity in the 21st century. So, it can be being used to answer all the problems faced by humans in the 21st century.

The role of education is very important to guide internet users to be more useful. The use of the internet for e-learning can help in teaching and learning activities in the classroom. E-learning is a good technology for the world of education, so there are no boundaries among users.

The use of e-learning aims to improve the quality of students. In addition, the use of e-learning will change the paradigm that originally used conventional media towards information technology-based learning media. Thus, learning activities will be more effective, efficient and increase the creativity of students through the use of e-learning-based media.

The application of e-learning to education is needed by all people in education. E-learning generally has no restrictions on user usage or classification [5]. The idea of AES (Adaptive E-Learning Systems) comes from hypermedia systems and intelligent tutoring systems to adapt the systems to the individual student [6]. E-learning is used to assist users to find information and to learn independently so that users can gather as much information as possible without having to wait for the teacher.

A web-based course designed for a specific group of students, like a traditional course, may not fit other students [7]. Students can access any course, wherever and whenever

according to need, so e-learning makes learning practices easier. A flexible learning system makes students more emphasized to access more information. E-learning is designed to be able to adapt to various platforms, such as web-based and mobile based.

The mobile-based technology can make learning more interactive. Although, its manufacture requires some testing to be used according to user needs. This interactive learning product based on mobile learning is conducted using several stages [8]. Although the use of mobile-based media can only be used for download activities, subject matter, group discussion, and exam.

The use of e-learning can be opened wherever and whenever because it is flexible. Blended learning allows outside learning students without classroom who learn with web conferencing, Skype, discussion boards, blogs, and social networking sites [9]. Thus, it makes vocational school students easier to access information outside the classroom. Considering the need for vocational schools is very crowded and requires very fast information.

In addition, the problem-based learning model can be applied with the help of e-learning. The digital world forms the concept of pedagogy to be flexible learning based on students' needs. Within the context of this online environment, the traditional roles of teacher and learners are reciprocal and symbiotic [10]. The 21st-century learning model requires an instructor to become a facilitator and no longer act as an expert who becomes the focus of attention or dominates in the classroom. Students must be active and creative in seeking information because this model makes students be able to increase knowledge without having to wait for the instructor to provide material on each face to face class.

The e-learning system provides different characteristics compared to another system. So e-learning becomes a bridge for each student's learning style so that students are very easy to lift information. Case-based learning can be applied in a virtual classroom, so students are faster and more responsive in absorbing the competencies taught [11]. However, students found that after graduation faced the gap between knowledge and industrial demand [12].

The application of e-learning is in line with government regulations that require schools to implement ICT-based learning. E-learning is a method for integrating ICT-based learning in schools, especially vocational schools in Bantul Regency, DIY. However, various problems arise related to the use of the e-learning. Based on a preliminary study, these problems include: (1) the use of e-learning has not been widely used in vocational schools, even though the relevant agencies have socialized; (2) the use of e-learning has not been implemented maximally by the teacher; (3) teachers are still preoccupied with school assignments/activities, so the time to make material is very lacking [5]. Based on these problems, there is a need for research related to the application of e-learning to improve student competency in vocational schools in Bantul Regency, Yogyakarta Special Region.

According to the Basic Data of Primary and Secondary Education, the Directorate General of Primary and Secondary

Education (DAPO DIDASMEN), shows that data on vocational school teachers in Bantul District in the 2017/2018 school year totaled 1,530 consisting of men: 720 and women 810 [13]. The number of teachers is spread over 218 Vocational Schools throughout Bantul Regency. Based on these data, it shows that vocational school teachers in Bantul Regency have a small number.

Basically, E-learning is a learning that utilizes information and communication technology to mediate asynchronous and synchronous in learning and teaching activities. As the letter "e" in e-learning which stands for electronic words. E-learning combines all activities of educational activities carried out by individuals and groups on conditions online and offline. Various types or modalities of e-learning activity are represented in table 1.

TABLE I. E-LEARNING MODALITIES SOURCE: [14]

Individualized self-paced e-learning online	Individualized self-paced e-learning offline
Group-based e-learning synchronously	Group-based e-learning asynchronously

The explanation of the table above is as follows [14]:

“Individualized self-paced e-learning online refers to situations where an individual learner is accessing learning resources such as a database or course content online via an Intranet or the Internet; Individualized self-paced e-learning offline refers to situations where an individual learner is using learning resources such as a database or a computer-assisted learning package offline; Group-based e-learning synchronously refers to situations where groups of learners are working together in real time via an Intranet or the Internet”.

Students can combine the competencies acquired in school through teachers and e-learning assistance to add to their insights. In addition, the industry practice program is the best choice to add insight into conditions in the workplace. Students can apply the competencies acquired at school during the industry practice. The difference in learning in the workplace is more emphasis on teamwork and being able to adapt to the environment. The Industrial Practice Program emphasizes teamwork and involves the community [15].

Research questions that must be answered in this paper are: (1) how are the conditions of teachers and facilities in schools in implementing e-learning ?; and (2) how to apply e-learning to vocational students?

II. METHOD

The method used in this research is qualitative naturalistic. Case study research is a qualitative study that seeks to discover meaning, investigate processes, and gain insight and understanding of individuals, groups, or situations [16].

The research was located in SMK Muhammadiyah 1 Imogiri Bantul and Universitas Alma Ata Yogyakarta. The

time of this research is carried out approximately 5 months that is counted from June to December 2017 by way of researcher first to approach informants, determine respondents, generate data, analyze data, and the last is write a research report.

The informants for this research are: (1) IT expert technicians; (2) lecturers (3) vocational school's teachers; and (4) students. Data collection techniques in this study used 3 ways, namely: (1) in-depth interview; (2) participatory observation; and (3) documents analysis. This data analysis is used by Miles, Huberman, & Saldaña's interactive model.

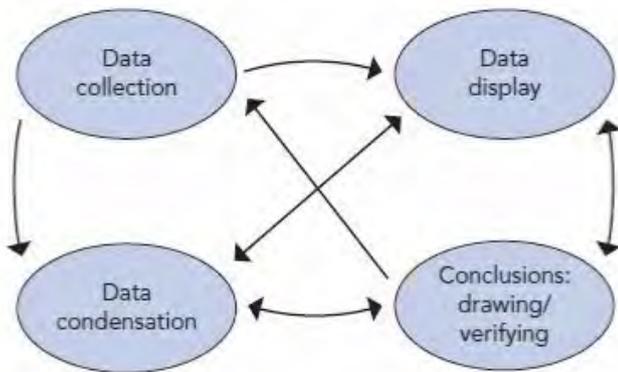


Fig. 1. Data analysis components: Interactive Model Source: [17].

III. RESULT AND DISCUSSION

A. Teachers Haven't Mastered ICT and Less Supporting Facilities

The application of e-learning in vocational schools has been increasingly aggressively socialized by the government. Vocational high school (SMK) is the right choice in implementing e-learning because it has a learning model that is different from other upper-level schools. Emphasis on theory and practice-based learning must be mastered in a balanced manner by students so that the competencies that must be mastered consist of adaptive, normative, and productive learning.

National flagship schools are the top priority in implementing e-learning as a learning support media. The impact arising from this policy is that some teachers who are

not yet proficient in ICT must be extra hard to use e-learning. In addition, the placement of ICT teachers to become teachers in counseling guidance (BK) becomes an alternative choice in order to help the problem of teachers who want to develop e-learning.

The assessment of online media models to be implemented is carried out continuously, so it has been established to develop social media-based e-learning. Edmodo becomes an e-learning alternative that is applied in schools as part of the integration of technology-assisted learning. Edmodo is a social learning network which part of the collaborative learning between teachers and students.

The features presented by Edmodo are very simple like Facebook. Users can integrate Edmodo easily because they are very familiar with Facebook, although teachers who are not familiar with the internet still find it difficult to implement it.

The application of e-learning began to be developed so that it could accommodate dynamic and interactive learning. Learning Management System (LMS) is the choice to develop the e-learning. The features presented are very diverse, so they can accommodate the needs for learning. LMS can be said to be a virtual class because it represents the real class, only the difference lies in face to face physically and non-physically.

LMS-based E-learning is on average only applied at the college level, because it has the ability to manage e-learning, such as providing bandwidth and large hosting space. While public schools or vocational schools are still constrained by facilities. Mr. IP explained the related concepts of e-learning (W.01, B.14):

Users of Moodle are universities, Moodle it has many features and fitting is used as an online-based learning media. The concept is like an online class. So administrators can create classes and match the subjects.

Moodle in content is very easily developed in educational institutions, including schools. Moodle has the completeness that suits the needs of management of virtual class. Through Moodle, students can follow activities, such as self-learning, collaborative learning, and increase students activeness in the following learning. Teachers are given authority to upload learning materials that students will download to be learned outside the classroom.

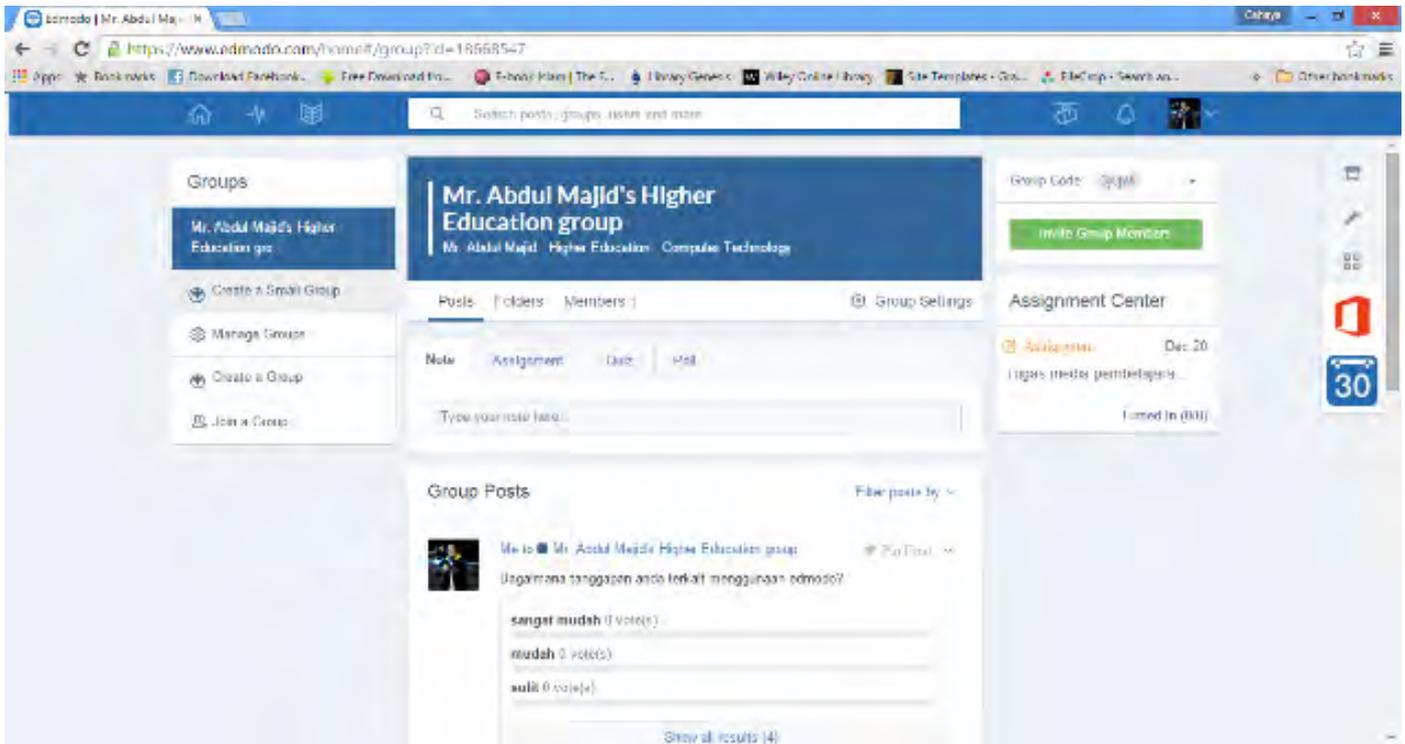


Fig. 2. Edmodo became a learning media in the classroom.

The application of Moodle as part of e-learning media gets a very tough challenge because it must provide training to teachers to be proficient in operating the e-learning. Some universities and the government have helped provide free e-learning sites for teachers to implement as classroom learning, but only a few teachers apply them in class. This is because there are not many teachers who master ICT well.

Assistance from IT technicians is not enough to help accommodate the needs of teachers in conducting online classroom management through e-learning. Limitations of experts to manage courses in Moodle make a major obstacle in the application of e-learning. Teachers aged above 50 on average are very difficult to be given e-learning operations training so that if the government gives a policy each teacher must use e-learning, the IT staff is overwhelmed in helping these teachers.

This condition occurs in several vocational schools, both state and private. The application of e-learning is mostly used

by young teachers who are already proficient in operating ICT. Teachers usually upload subject matter to e-learning and students are asked to download material for learning outside the classroom. Even the collection of tasks is carried out in the e-learning so that feedback and FAQs occur through e-learning between teachers and students.

B. E-learning Used to Upload Course Materials, Some to Create Online Quizzes, and Discussions

Moodle has been providing several features that can be used by the teacher. Salah satu fitur yang dapat dimanfaatkan adalah course categories. Courses are the spaces on Moodle where teachers add learning materials for their students and course categories organize courses for all Moodle site participants [18]. A Course creator, Administrator can put all courses in the group category, however, teachers and students will find it.

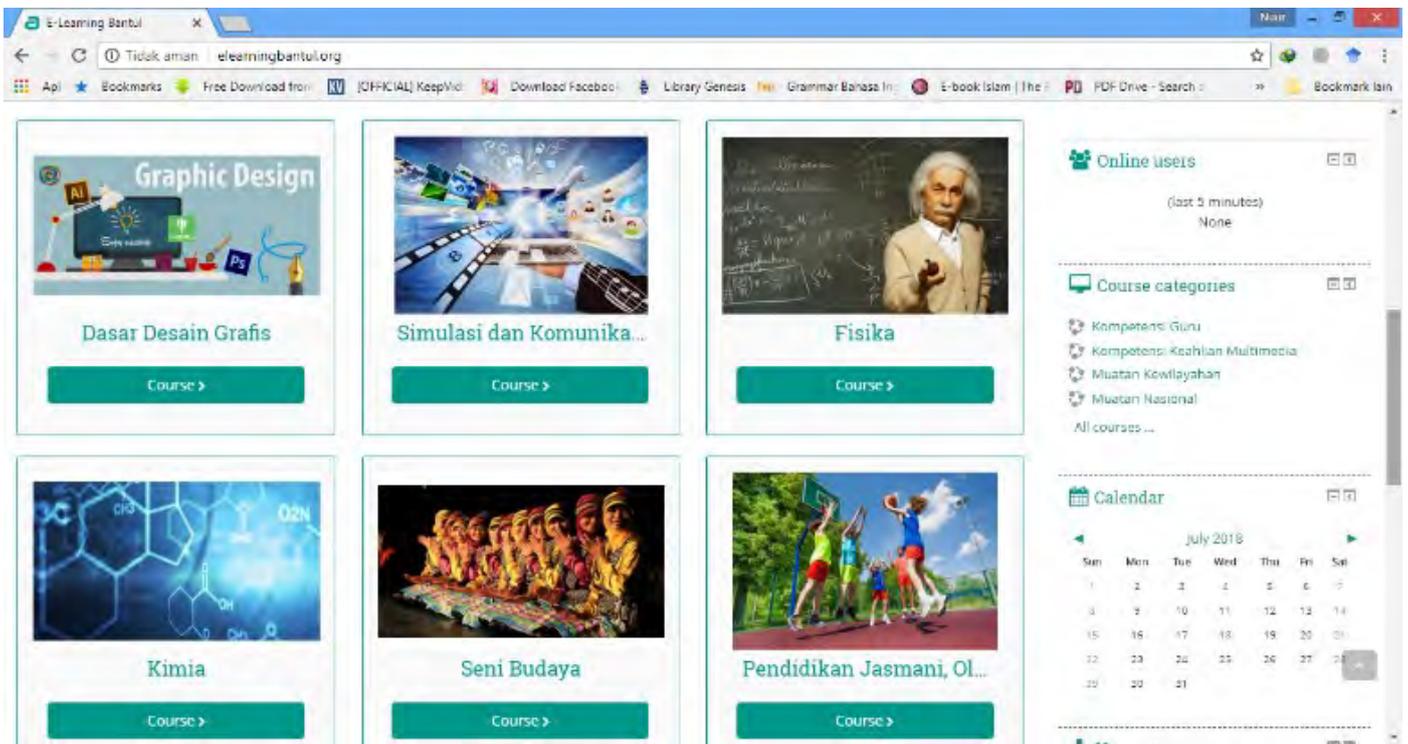


Fig. 3. Course category as one of Moodle's features.

The teacher can manage the course according to the subjects taught to students. The teacher can enter the material according to the time of the meeting because in the course the area is provided based on the number of meetings per week. In addition, the discussion and uploading services are also provided on the course. The teacher can provide a quiz as an online or computer-based test. So that there is no need to make a problem and arrange the room schedule for the exam.

The learning process using e-learning is needed by schools because it can facilitate teachers in delivering material and accelerating learning outcomes in students. Learning to use e-learning will form a community and become a social partnership. The formation of student competencies and their application can be achieved through the concept of social partnerships, and the competencies obtained can be applied contextually [19]. Students are expected to be able to incorporate the competencies acquired into their subconscious so that they can implement them continuously and develop those competencies.

C. E-learning is Used by a Young Teacher or Those Who Master of The ICT Field

The average e-learning user is an IT technician at the school. The technicians were asked by the leadership to manage e-learning, even though practically on the ground more teachers were not used. This is because most teachers say that the use of e-learning is too complicated and takes a long time to learn. Especially the average teacher who feels the difficulty of using ICT is over 50 years old.

Teachers aged between 20 - 45 years on average are more active in implementing and developing e-learning as part of classroom learning. Young teachers who understand IT have more ability in managing courses, so e-learning becomes active and becomes a discourse media between students and teachers.

This problem actually occurs in all regions, because the gap in the mastery of ICT for teachers over the age of 50 is still relatively low. Although the reality can be supported by IT technicians and young teachers who are adept at managing e-learning.

The government must collaborate with universities that focus on education or Education Institutions for Education Personnel (LPTK) to prepare and train the use of e-learning for Vocational School teachers. In addition, the LPTK university can develop e-learning through the activities of the Higher Education Tri Dharma in the form of research and community service related to the development of e-learning.

D. Governments and Non-Government Organizations Have Provided an E-Learning for Educator

E-learning began to be applied in schools after the establishment of the 2013 Curriculum which integrates technology-based learning. The application of e-learning is expected to help the absorption of knowledge that is Personnel (LPTK) to prepare and train the use of e-learning for Vocational School teachers. In addition, the LPTK university can develop e-learning through the activities of the Higher Education Tri Dharma in the form of research and community service related to the development of e-learning.

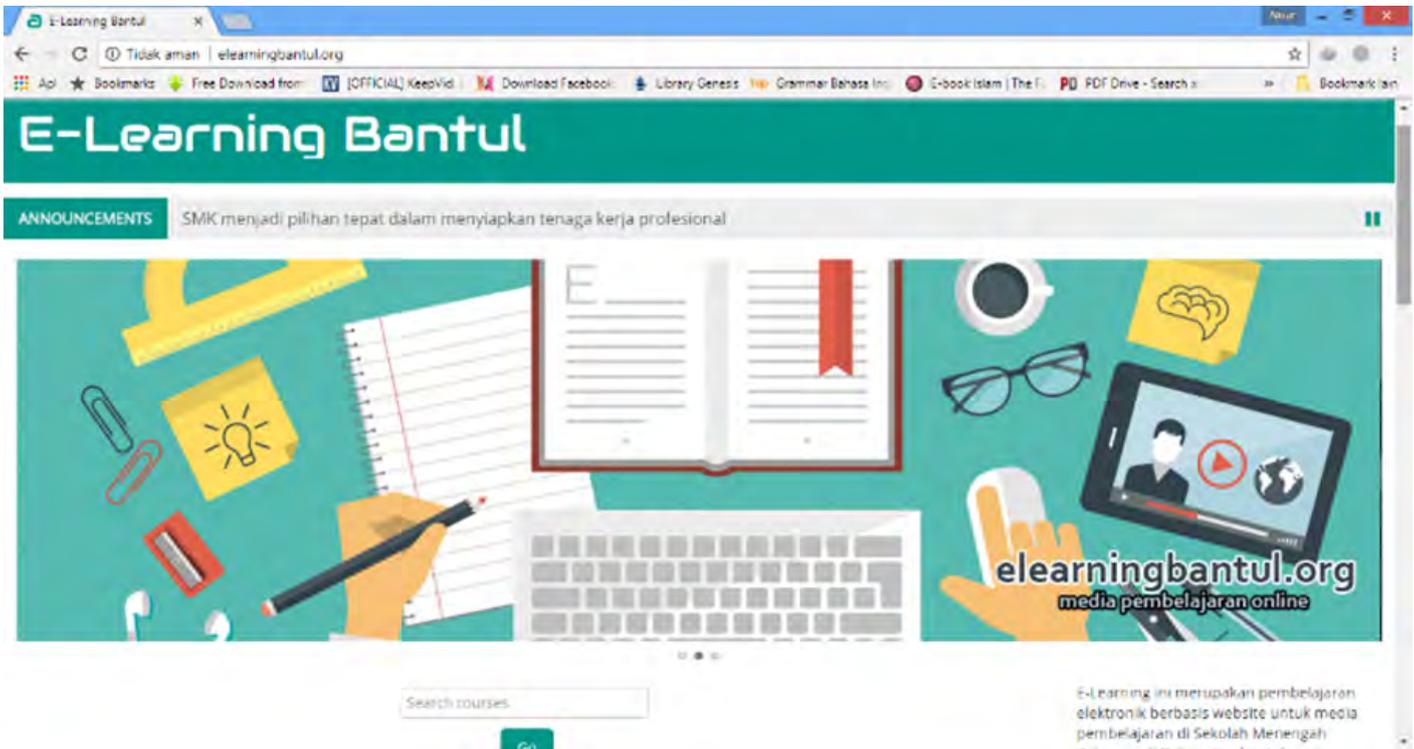


Fig. 4. E-learning provided by NGOs in Bantul district.

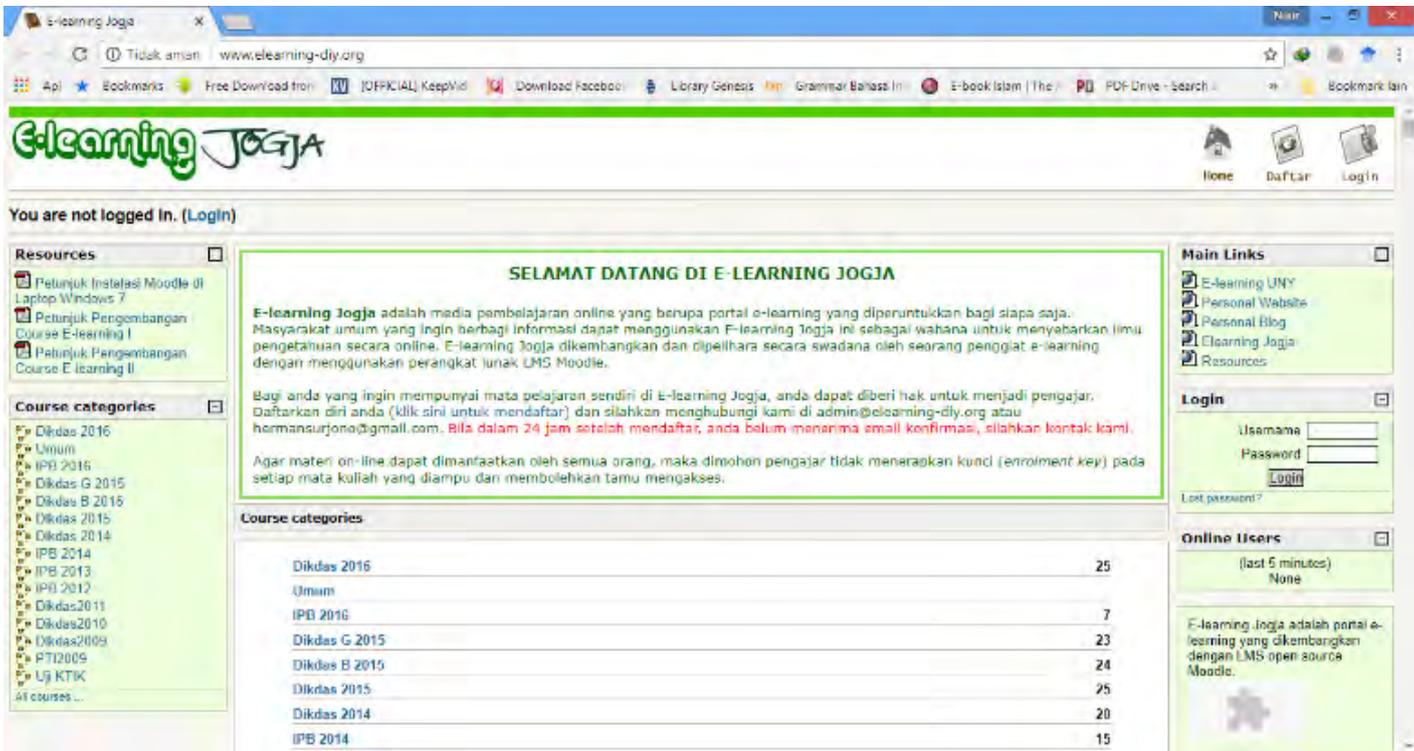


Fig. 5. E-learning provided by NGOs in DIY.

IV. CONCLUSION

The result showed that: (1) teachers haven't been fully exploiting of e-learning to support adaptive learning in class,

because they mostly haven't mastered of ICT and lack of supporting facilities; (2) e-learning used to upload course materials, some to create online quizzes, and discussions; (3) e-learning is used by young teacher or those who master of the

ICT field and average in study program of ICT; and (4) governments and NGOs have provided an e-learning for schools, teachers, students, and other that they can use it for learning but few users use it.

The government has actually been socializing the use of Edmodo as an alternative to e-learning, but there are many obstacles faced by teachers in applying e-learning in the classroom. One obstacle is the lack of skills in the use of ICT, especially for older teachers.

REFERENCES

- [1] M.S.D. Iswanto, Survei BPS: Jumlah Pengguna Internet Indonesia Tahun 2013 Tembus 71 Juta Orang [Online]. Retrieved from: <https://statistiknawangan.blogspot.com/2015/01/survei-bps-pengguna-internet-tembus-71.html>, 2015.
- [2] T. Sembiring, Siaran Pers Tentang Riset Kominfo dan UNICEF Mengenai Perilaku Anak dan Remaja Dalam Menggunakan Internet [Online]. Retrieved from: kominfo.go.id, 2014.
- [3] D.S. Jumadi, B. Maylawati, B. Subaeki, and T. Ridwan "Opinion Mining on Twitter Microblogging Using Support Vector Machine: Public Opinion about State Islamic University of Bandung Cyber and IT Service Management," Internasional Conference on Information Technology for Cyber and IT Service Management, pp. 1-6, 2016.
- [4] C. Latchem, The Demands and Challenges Using ICTs and Blended Learning in Transforming TVET ed C Latchem (Canada: UNESCO and Commonwealth of Learning) p 9, 2017.
- [5] N.W. Abdulmajid, A. Pramuntadi, A.B. Riyanto, and E. Rochmah, "Penerapan E-Learning Sebagai Pendukung Adaptive Learning dan Peningkatan Kompetensi Siswa SMK di Kabupaten Bantul" J. Taman Vokasi, vol. 5, no. 2, pp. 170-182, 2017.
- [6] H.D. Surjono, "The Design of Adaptive E-Learning System based on Student's Learning Styles," International Journal of Computer Science and Information Technologies, pp 2350-3, 2011.
- [7] H.D. Surjono, "The design and implementation of an adaptive e-learning system," The International Symposium Open, Distance, and E-learning, 2007.
- [8] T. Werdiningsih, M.B. Triyono, and N.W.A. Majid, "Interactive Multimedia Learning based on Mobile Learning for Computer Assembling Subject using the Principle of Multimedia Learning (Mayer)," 3rd International Conference on Current Issues in Education, 2018.
- [9] M. Tshabalala, C. Ndeya-Ndereya, and T. Merwe van der, "Implementing Blended Learning at a Developing University: Obstacles in the way Electron," J. e-Learning, vol. 12, pp. 101-10, 2012.
- [10] W. Barber W and S. King, "Teacher-Student Perspectives of Invisible Pedagogy: New Directions in Online Problem-Based Learning Environments Electron," J. e-Learning, vol. 14, pp. 235-43, 2016.
- [11] E. Rochmah and N.W.A. Majid, "Membangun virtual classroom melalui social learning networks (SLNS)," Prem. Educ. J. Pendidik. Dasar dan Pembelajaran, vol. 8, pp. 15-21, 2018.
- [12] R.I. Rokhmawati and S.A. Wicaksono, An Analytical Factor about Determinants and Obstacles of Vocational High School Students' Internship. Regionalization and Harmonization in TVET: Proceedings of the 4th UPI International Conference on Technical and Vocational Education and Training ed A G Abdullah, T Aryanti, A Setiawan and M Binti Alias (Leiden: CRC Press), 2017.
- [13] Dinas Pendidikan dan Kebudayaan, "Data Pokok Pendidikan Dasar dan Menengah," [online]. Retrieved from: <http://dapo.dikdasmen.kemdikbud.go.id/guru/2/040100>, 2017.
- [14] S. Naidu, E-learning: A Guidebook of Principles, Procedure and Practice. (2nd Edition) (New Delhi: Commonwealth Educational Media Centre for Asia), 2006.
- [15] N.W.A. Majid, Proses Perolehan Kompetensi Teknologi Informasi dan Komunikasi (TIK) dalam Program Praktik Industri pada Industri Pasangan SMKN 2 Pengasih Kulon Progo (UNY), 2015, Unpublished.
- [16] Emzir, Metode penelitian kualitatif: analisis data (Jakarta: Rajawali Pers), 2010.
- [17] M.B. Miles, A.M. Huberman and J. Saldaña Qualitative data analysis: A methods sourcebook (New York: SAGE Publications, Inc.), 2014.
- [18] Moodle, Course [Online]. Retrieved from: <https://docs.moodle.org/28/en/Courses>, 2018.
- [19] N.W.A. Majid and P. Sudira, "Proses perolehan kompetensi TIK melalui program praktik industri siswa SMKN 2 Pengasih Kulon Progo," J. Pendidik. Vokasi, vol. 7, pp. 14-29, 2017.